Student Name: _____

South Carolina
High School Assessment Program

Mathematics

Release Form

Mathematics

Directions

This test has 65 questions: 62 multiple-choice questions and 3 constructed-response questions.

Do your scratch work for all of the questions in your test booklet or on the graph paper provided. Use only a Number 2 pencil to mark or write your answers in the test booklet.

You may use the provided Reference Information sheet at any time during this test. This sheet contains formulas and other information that you may need.

Figures in this test are drawn as accurately as possible, except when the question states specifically that the figure is not drawn to scale.

You may use a calculator during any part of this test.

Multiple-Choice Questions (1–62)

- Try to answer each question, even if you are not sure of the answer.
- Darken completely only one bubble for your answer to each question.
- Erase completely the first answer you marked if you change an answer.

Constructed-Response Questions (63–65)

- Read all parts of these questions carefully before you answer them.
- These questions require that you write your answers and show your work to support your answers.
- Be sure that your work clearly supports your answers, since there may be several ways to get an answer.
- You must show all of your work and answer all parts of the question appropriately to receive full credit.
- If you use a calculator, explain how you got your answer. Just stating that you used a calculator is not an acceptable explanation.
- Write legibly and dark enough so that your responses can be read and scored.
- Use labels, titles, keys, and measurement units when needed.
- Check your work for completeness and accuracy.

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Go on ☞

1. At the beginning of the month, Sue had a balance of $143 in her bank account. During the month, she made deposits of $325 and $172. She wrote checks for $62, $213, and $124.

What was the new balance in her bank account at the end of the month?

A. $98

B. $241

C. $399

D. $497

HMSC0080

2. The square root of 60 is between which two numbers?

A. 5 and 15

B. 15 and 25

C. 25 and 35

D. 35 and 60

HMSC0011

3. Takeya solved this equation using the steps shown.

Given:	$4x - 3 = 2x + 7$
Step 1:	$4x = 2x + 10$
Step 2:	$2x = 10$
Step 3:	$x = 5$

Which operation did Takeya use to get from Step 2 to Step 3?

A. subtracted 5 from both sides

B. subtracted x from both sides

C. divided both sides by 5

D. divided both sides by 2

HMSC1354

Go on ☞

4. In a class of 60 students, 30% own a pet.

How many students in the class own a pet?

A. 18

B. 30

C. 42

D. 90

HMSC0277

5. Julia walked 3.1 miles on Monday, 4.8 miles on Wednesday, and 3.9 miles on Friday.

Which of the following is the best estimate of the total number of miles that Julia walked?

A. 10

B. 11

C. 12

D. 13

HMSC1631

6. These matrices represent the number of people who work at two branches of Howard Publishing.

South Branch

	Male	Female
Day	12	6
Night	4	4

North Branch

	Male	Female
Day	12	24
Night	8	16

Which matrix below represents the total number of people working at both branches?

A. $\begin{bmatrix} 12 & 24 \\ 8 & 16 \end{bmatrix}$

B. $\begin{bmatrix} 24 & 28 \\ 14 & 20 \end{bmatrix}$

C. $\begin{bmatrix} 16 & 20 \\ 10 & 40 \end{bmatrix}$

D. $\begin{bmatrix} 24 & 30 \\ 12 & 20 \end{bmatrix}$

HMSC1133

7. On the computer, Carol enlarged a photo to 2^9 dots per inch.

How many dots per inch is the enlarged photo?

A. 18

B. 29

C. 256

D. 512

HMSC0792

8. Simplify: $3 + 2(6 - 2^2)$

A. 7

B. 10

C. 35

D. 80

HMSC1550

9. The distance between Town A and Town B is 213 miles. Ralph drove at an average speed of 58 miles per hour.

Which of the following is a reasonable amount of time for Ralph to drive from Town A to Town B?

A. between 1 and 2 hours

B. between 2 and 3 hours

C. between 3 and 4 hours

D. between 4 and 5 hours

HMSC0562

10. At the store, Mimi paid \$0.84 for seven oranges.

At this rate, how much will she pay for 24 oranges?

A. \$1.08

B. \$1.68

C. \$2.84

D. \$2.88

HMSC0560

11. The average distance between Earth and the Sun is about 149,000,000 kilometers.

How is this number written in scientific notation?

A. 1.49×10^6

B. 1.49×10^7

C. 1.49×10^8

D. 14.9×10^9

HMSC0256

12. The Cineplex movie theater sold 280 tickets to a comedy, 175 tickets to a drama, and 245 tickets to an action film.

What percentage of the total tickets sold were to the action film? (Round your answer to the nearest percent.)

A. 25%

B. 35%

C. 58%

D. 61%

HMSC0727

13. Bridgeport is 924 miles from Danville. Coopertown is three-fourths of the distance from Bridgeport to Danville.

How many miles is it from Bridgeport to Coopertown?

A. 231

B. 308

C. 462

D. 693

HMSC1206

14. A drink contains 20% cranberry juice and the rest is apple juice.

What is the ratio of cranberry juice to apple juice?

A. 1:4

B. 1:20

C. 4:1

D. 20:1

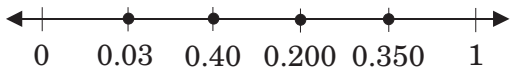
HMSC1171

15. Mallory is ordering these decimals.

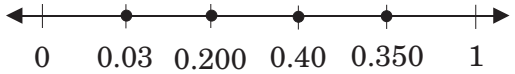
0.40, 0.350, 0.200, 0.03

Which number line shows these decimals in the correct order? (Number lines are not drawn to scale.)

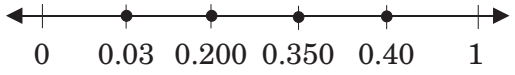
A.



B.



C.



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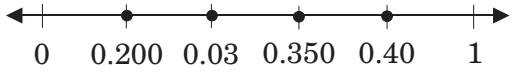


HMSC0780

16. Aida divides a number greater than 100 by a number greater than 10.

Which statement about Aida's quotient is always true?

A. It is greater than 0.

B. It is greater than 1.

C. It is greater than 10.

D. It is greater than 100.

HMSC1367

17. A number pattern is shown below.

50, 30, 40, 20, 30, . . .

If this pattern continues, what number will come next?

A. 10

B. 20

C. 30

D. 40

HMSC1459

18. Solve for k.

$$k - 9 = 36$$

A. $k = -4$

B. $k = 4$

C. $k = 27$

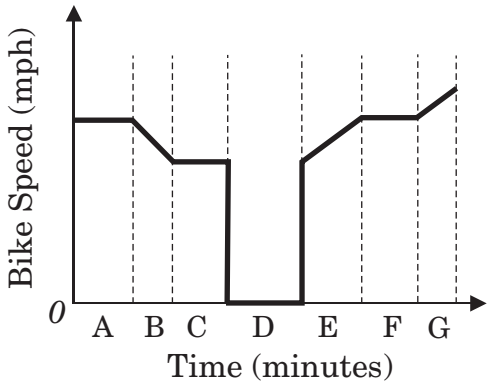
D. $k = 45$

HMSC1306

Go on ☞

19. Steve went for a bike ride. This graph shows the relationship between his bike speed and his time.

Steve's Bike Ride



During which interval(s) was Steve **not** moving?

A. B only

B. D only

C. B, E, and G

D. A, C, D, and F

HMSC0753

20. Penelope opened a savings account with $200.

If she withdraws x dollars from her account, which expression represents the new balance?

A. $200 + x$

B. $-(x + 200)$

C. $x - 200$

D. $200 - x$

HMSC0467

21. If $c = 5$ and $d = 3$, what is the value of $2c + c(d^2 - 6)$?

A. 25

B. 45

C. 49

D. 129

HMSC0035

Go on ☞

22. Solve for x.

$$6x + 5 = -x + 40$$

A. $x = -9$

B. $x = -5$

C. $x = 5$

D. $x = 9$

HMSC0073

23. Simplify: $(z^6)(z^2)$

A. z^3

B. z^4

C. z^8

D. z^{12}

HMSC1329

24. Simplify:

$$3x^2 + 4x - 7 - x^2 - 2x + 3$$

A. $2x^2 + 2x - 4$

B. $2x^2 + 2x - 10$

C. $2x^2 + 6x - 4$

D. $2x^2 + 6x - 10$

HMSC0994

25. Jerry placed 32 pounds of ice in a tub. Every 15 minutes, half of the remaining ice melted, as shown in this table.

Time (min)	0	15	30
Ice left (lb)	32	16	8

How many pounds of ice were left after one hour?

A. 0

B. $\frac{1}{2}$

C. 1

D. 2

HMSC0667

26. Simplify: $4x(2x^2 - 5x + 3)$

A. $8x^2 - 5x + 3$

B. $8x^2 - 20x + 12$

C. $8x^3 - 5x + 3$

D. $8x^3 - 20x^2 + 12x$

HMSC1571

27. The Booster Club has a goal of raising at least \$500. It has already raised \$100. The club is sponsoring a pancake breakfast and charging \$5.00 per ticket.

Which inequality represents the number of tickets (t) that the club must sell to meet its goal?

A. $5t \geq 500$

B. $5t \geq 100$

C. $5t + 100 \geq 500$

D. $(5 + 100)t \geq 500$

HMSC1495

Go on ☞

28. Simplify: $(k^7)^2$

A. k^9

B. k^{14}

C. k^{49}

D. k^{72}

HMSC1331

29. If $f(x) = 2x^3 - 2$, what is the value of $f(2)$?

A. 6

B. 10

C. 14

D. 62

HMSC0941

30. Two apples and three peaches cost \$1.65. Three apples and two peaches cost \$1.60.

What is the cost of one peach?

A. \$0.30

B. \$0.35

C. \$0.60

D. \$0.70

HMSC0083

31. Which set of data can be represented by a straight line?

A.

x	y
1	5
2	10
3	15

B.

x	y
1	1
2	4
3	9

C.

x	y
0	0
4	2
16	4

D.

x	y
1	1
2	8
3	27

HMSC0856

32. This table contains some points on a line.

x	y
1	– 2
3	2
5	6

Which equation represents this line?

A. $y = \frac{1}{2}x + 2$

B. $y = x - 3$

C. $y = 2x - 4$

D. $y = 3x - 5$

HMSC0998

33. If the equation $y = x + 3$ is changed to $y = x + 6$, how will the graph of the line change?

A. It will shift 3 units to the right of the graph of $y = x + 3$.

B. It will shift 6 units to the right of the graph of $y = x + 3$.

C. It will shift 3 units up from the graph of $y = x + 3$.

D. It will shift 6 units up from the graph of $y = x + 3$.

HMSC0243

34. Solve for x.

$$x^2 - 5x = 24$$

A. $x = -3$ and $x = -8$

B. $x = 3$ and $x = -8$

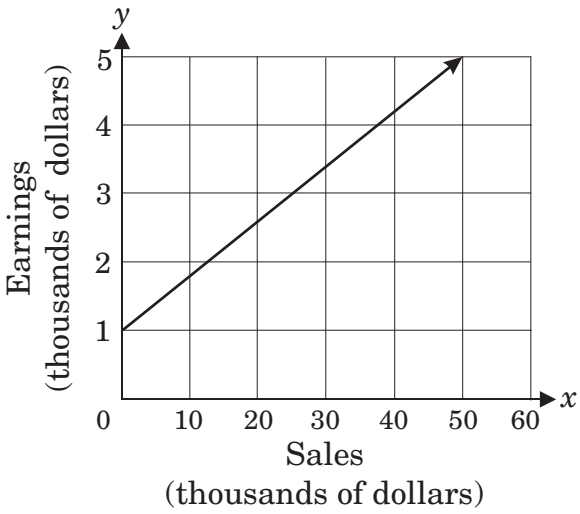
C. $x = -3$ and $x = 8$

D. $x = 3$ and $x = 8$

HMSC1003

35. Ian works at a car dealership and earns a base salary each month plus a percentage of his sales. This graph shows his earnings.

Ian's Earnings



If Ian's boss increases the percentage of his sales, how will the graph of this line change?

A. It will have the same slope and the same y-intercept.

B. It will have a different slope but the same y-intercept.

C. It will have the same slope but a different y-intercept.

D. It will have a different slope and a different y-intercept.

HMSC1556

36. New flooring will be put in a meeting room which is 15 feet wide and 34 feet long.

What is the area of this room in square feet?

A. 49

B. 98

C. 255

D. 510

HMSC1731

37. Which solid has six congruent faces?

A. cone

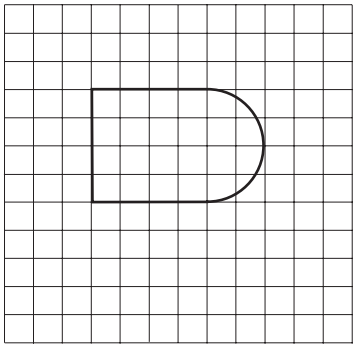
B. cube

C. cylinder

D. square pyramid

HMSC1582

38. A figure is shown on this grid.



□ = 1 square unit

Which of the following is the best estimate of this figure's area in square units?

A. 16

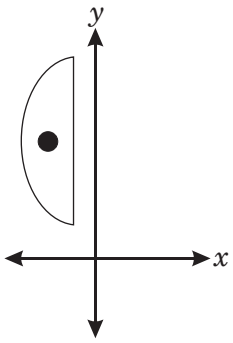
B. 18

C. 22

D. 24

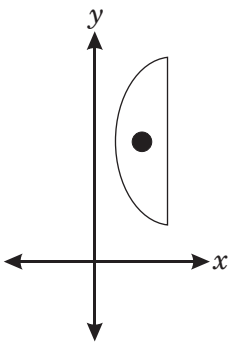
HMSC0099

39. This figure is on a coordinate plane.

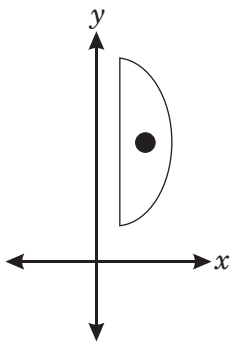


Which of the following shows a reflection of this figure across the y-axis?

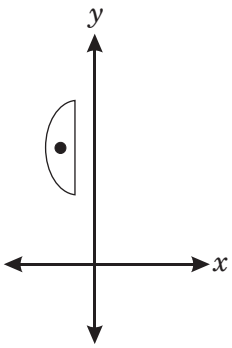
A.



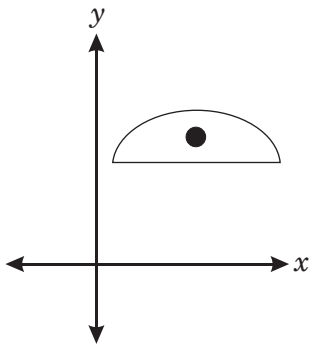
B.



C.

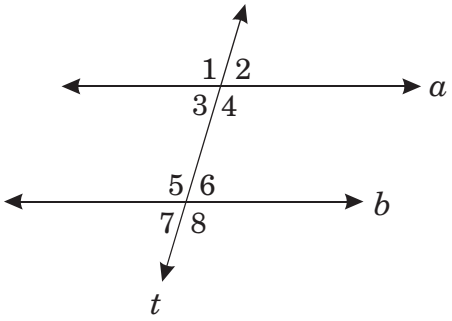


D.



HMSC0162

40. In this figure, line a is parallel to line b.



If the measure of $\angle 3$ is 68°, what is the measure of $\angle 6$?

A. 22°

B. 32°

C. 68°

D. 112°

HMSC0067

41. Raquel is graphing a rectangle on a coordinate plane. Three of the vertices are located at (2, 3), (–2, 3), and (2, –3).

What are the coordinates of the fourth vertex?

A. (–3, –2)

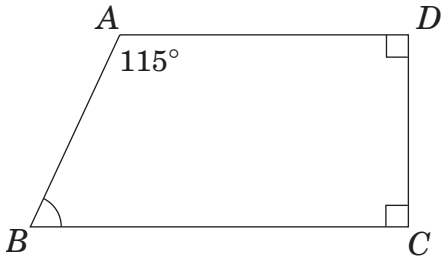
B. (–2, –3)

C. (2, –3)

D. (3, 2)

HMSC0184

42. A plot of land for a park is shown in this diagram.



What is the measure of $\angle B$?

A. 25°

B. 45°

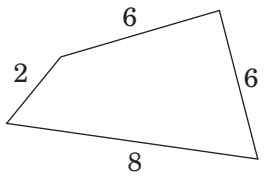
C. 65°

D. 75°

HMSC0888

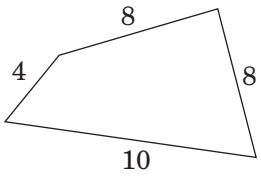
Go on ☞

43. A figure is shown below.

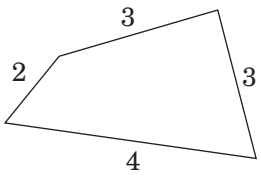


Which of the following is similar to this figure? (The figures are not drawn to scale.)

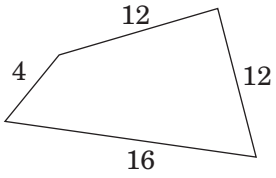
A.



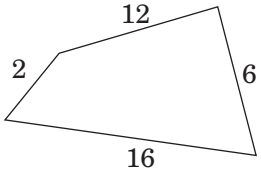
B.



C.



D.



HMSC1612

44. Andrew baked a round cake with a diameter of 12 inches. He put a ring of frosting around the outer edge of the top of the cake.

How many inches of frosting did Andrew put around the top of the cake? (Round your answer to the nearest inch.)

A. 19

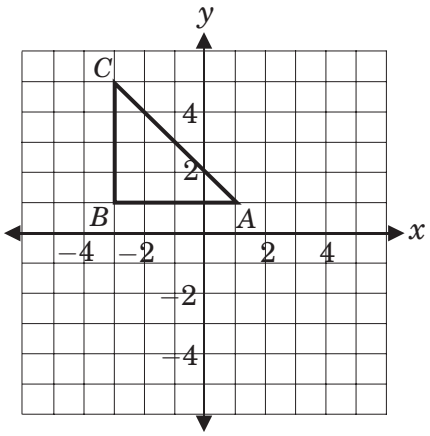
B. 38

C. 75

D. 113

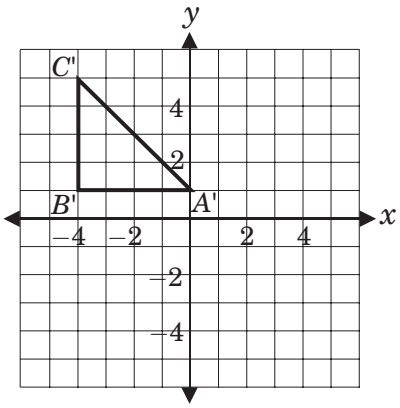
HMSC1486

45. Triangle *ABC* is shown below.

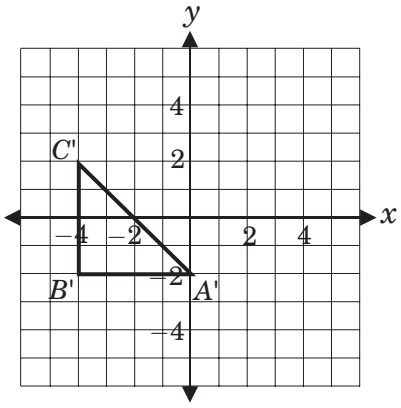


Which graph represents a translation of triangle *ABC* one unit to the left and three units down?

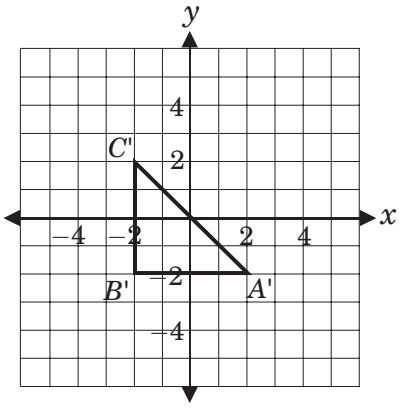
A.



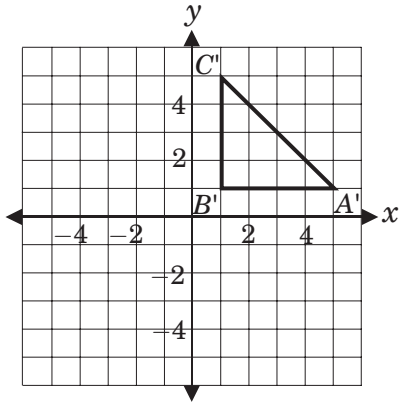
B.



C.



D.



HMSC0908

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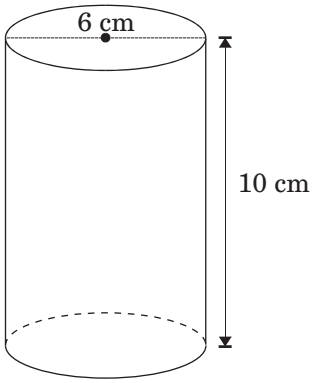
46. A cylinder is shown below.



What is the approximate surface area of this cylinder in square centimeters?

A. 150.72

B. 216.66

C. 226.08

D. 244.92

HMSC1595

47. A bike race is represented on a coordinate graph. The race begins on a path at the base of a hill, located at Point $D(1, 1)$, and ends at the top of the hill, located at Point $E(6, 2)$.

What is the slope of the path up the hill?

A. 0

B. $\frac{1}{5}$

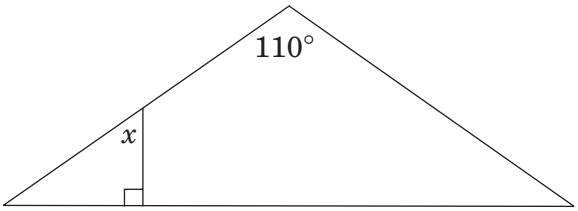
C. $\frac{7}{3}$

D. 5

HMSC0858

Go on ☞

48. This diagram shows a cross section of a roof. The roof outline forms an isosceles triangle.



If the angle at the peak measures 110°, what is the value of x?

A. 35°

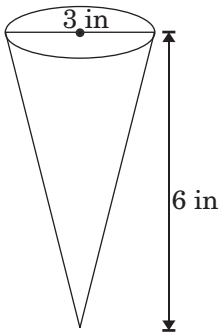
B. 45°

C. 55°

D. 60°

HMSC0398

49. A cone is shown below.



Approximately how many cubic inches of sand are needed to completely fill the cone?

A. 9.4

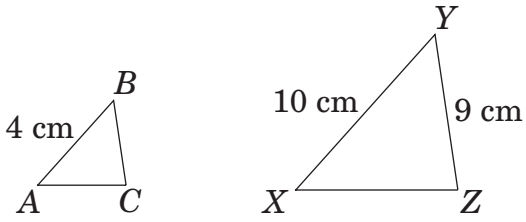
B. 14.1

C. 42.4

D. 56.5

HMSC0316

50. Triangle ABC is similar to triangle XYZ as shown.



What is the length of side $\overline{BC}$?

A. 3.0

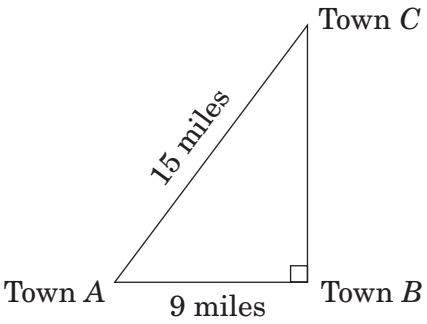
B. 3.6

C. 6.0

D. 6.6

HMSC0466

51. This diagram shows the locations of Towns A, B, and C.



If a person travels from Town A to Town B to Town C, what is the total distance traveled?

A. 12 miles

B. 15 miles

C. 21 miles

D. 36 miles

HMSC0600

52. The density of water is 1,000 kilograms per cubic meter. This density can be converted to different units using this expression.

$$\frac{1{,}000 \text{ kilograms}}{1 \text{ meter}^3} \times \frac{1{,}000 \text{ grams}}{1 \text{ kilogram}} \times \frac{1 \text{ meter}^3}{1{,}000 \text{ liters}} \times \frac{1 \text{ liter}}{5 \text{ cups}}$$

What are the resulting units of this conversion?

A. kilograms per liter

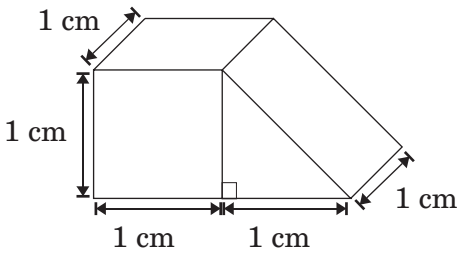
B. grams per cup

C. kilograms per cup

D. grams per liter

HMSC1546

53. A solid is shown below.



What is the volume of this solid in cubic centimeters?

A. 0.5

B. 1.0

C. 1.5

D. 2.0

HMSC0191

54. Aaron ran two miles on Saturday.

About how many feet did he run?

A. 1,800

B. 3,500

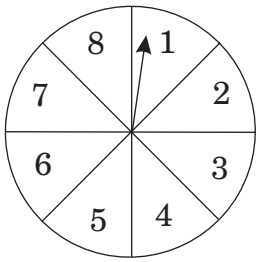
C. 5,200

D. 10,500

HMSC0735

Go on ☞

55. This fair spinner is divided into equal sections.



If the spinner is spun once, what is the probability of the spinner landing on 6?

A. $\frac{1}{8}$

B. $\frac{1}{6}$

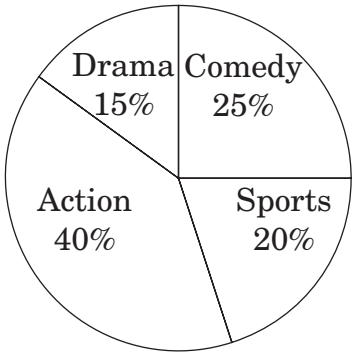
C. $\frac{6}{8}$

D. $\frac{8}{6}$

HMSC0236

56. This graph shows the types of videos people selected as their favorite.

Favorite Videos



If 80 people were surveyed, how many chose Drama as their favorite video?

A. 12

B. 15

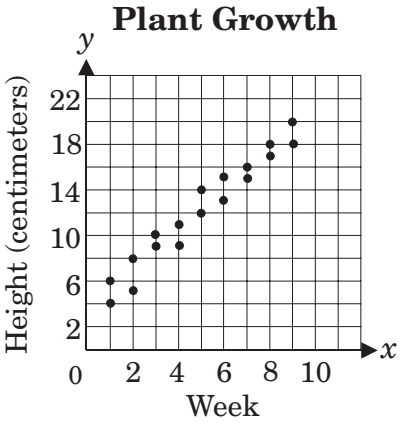
C. 65

D. 68

HMSC1383

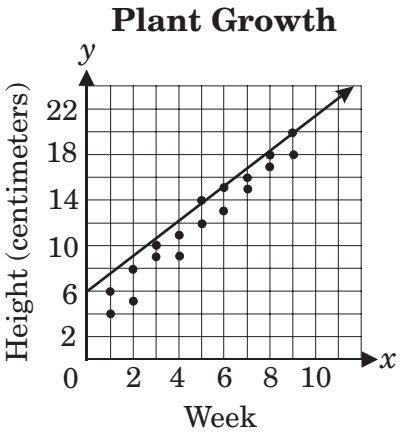
Go on ☞

57. Kyle recorded the growth of two plants.
This scatterplot shows his data.

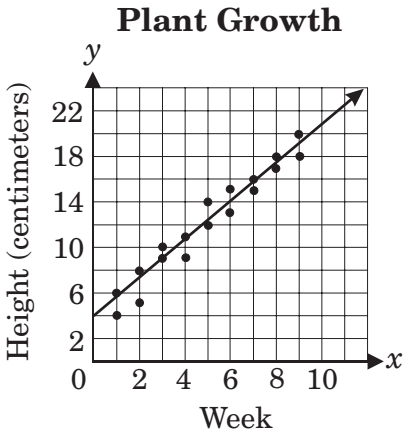


Which graph most accurately represents the line of best fit for this scatterplot?

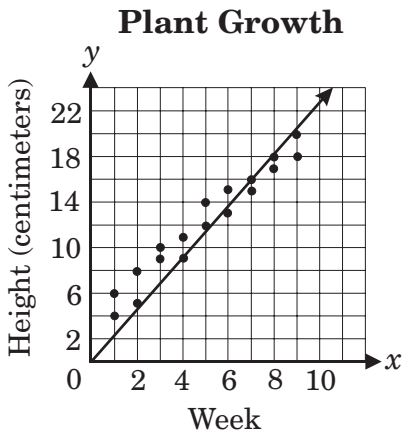
A.



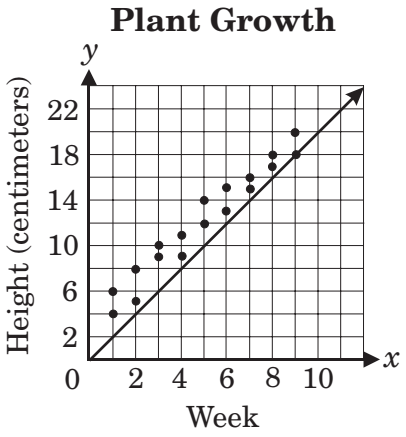
B.



C.



D.

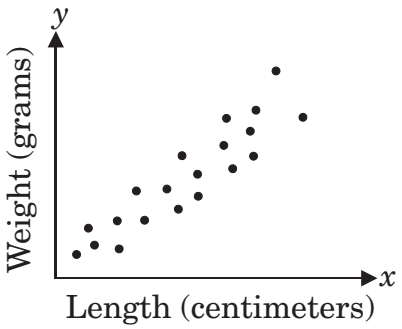


HMSC0447

Go on ☞

58. The zoo has a collection of snakes. This scatterplot shows the relationship between the lengths and weights of the snakes.

Snake Collection



Which type of correlation best describes the relationship shown by these data?

A. positive correlation

B. negative correlation

C. no correlation

D. cannot be determined

HMSC0163

59. Cara asked six friends how many hours of television they watched in one week. Their responses are shown below.

$2\frac{1}{2},\ 10,\ 7\frac{1}{2},\ 9,\ 2\frac{1}{2},\ 7\frac{1}{2}$

What is the median number of hours of television Cara's friends watched?

A. 6

B. $6\frac{1}{2}$

C. $7\frac{1}{2}$

D. 9

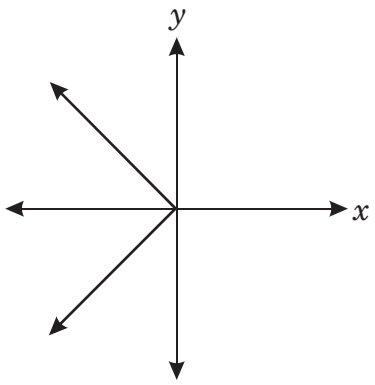
HMSC0106

60. This table of data represents a function.

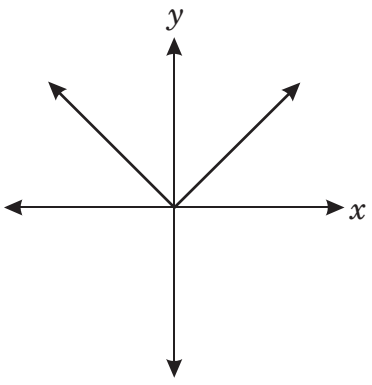
x	y
−2	2
−1	1
0	0
1	1
2	2

Which graph best represents this function?

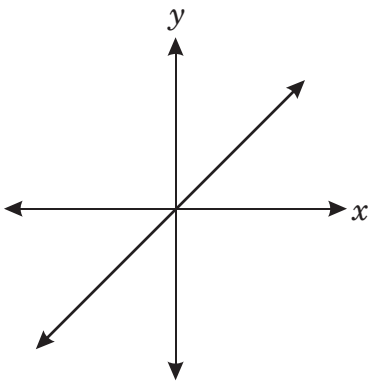
A.



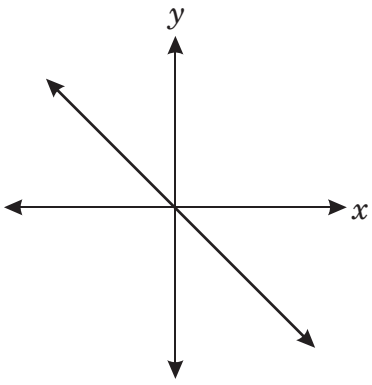
B.



C.



D.

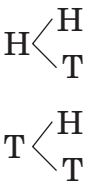


HMSC0445

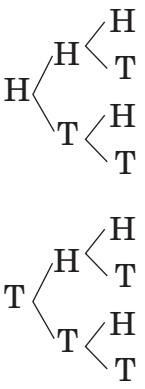
61. Kelly tossed a coin three times.

Which tree diagram represents all the possible outcomes of tossing the coin three times?
(H = heads; T = tails)

A.

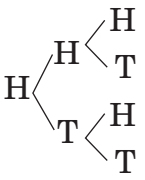


B.



C. H–T–H
T–H–T

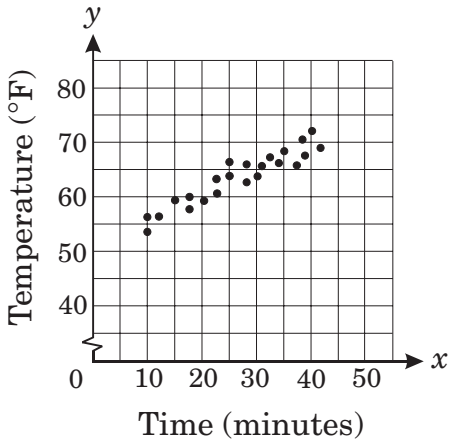
D.



HMSC0372

62. This scatterplot shows some data Kayla collected.

Kayla's Data



Which equation most accurately represents the line of best fit for Kayla's scatterplot?

A. $y = 2x$

B. $y = 2x + 50$

C. $y = \frac{1}{2}x$

D. $y = \frac{1}{2}x + 50$

HMSC0407

Go on ☞

This is the end of the multiple-choice section of the test. Read the directions for the constructed-response section of the test.

Directions for Constructed-Response Questions (63–65)

- Read all parts of these questions carefully before you answer them.
- These questions require that you write your answers and show your work to support your answers.
- Be sure that your work clearly supports your answers, since there may be several ways to get an answer.
- You must show all of your work and answer all parts of the question appropriately to receive full credit.
- If you use a calculator, explain how you got your answer. Just stating that you used a calculator is not an acceptable explanation.
- Write legibly and dark enough so that your responses can be read and scored.
- Use labels, titles, keys, and measurement units when needed.
- Check your work for completeness and accuracy.

When you are finished with the three constructed-response questions

- you may go back and check your work.
- grid your STOP TIME on the inside front cover.
- answer the questions on the Student Questionnaire.

Go on ☞

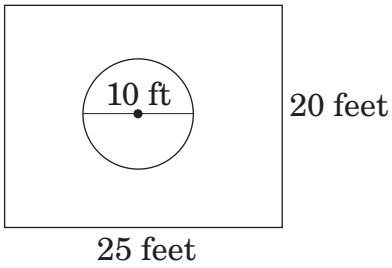
63. Andrew needs to buy exactly 120 cans of soft drinks for the school dance. Zesty Cola costs $3.59 for a pack of 6 cans and $14.99 for a case of 24 cans.

What is the least expensive method to buy 120 cans of Zesty Cola? Show your work to support your answer.

Answer: _____

HMSC1068c

64. Paige wants to plant grass in her backyard. Her backyard is a rectangle with a circular fish pond in the center as shown.



a. Approximately how many square feet of her backyard will Paige plant with grass? Show your work to support your answer.

Answer: _____

b. A bag of grass seed covers 150 square feet. What is the least number of bags of grass seed that Paige will need? Show your work to support your answer.

Answer: _____

HMSC0725c

65. The manager at a food distribution warehouse takes temperature readings of the refrigerator twice a day and keeps a record as shown in this table.

Day	Temperature °F	
	8:00 A.M.	4:00 P.M.
1	33	36
2	35	37
3	34	35
4	33	34
5	34	35
6	36	37
7	32	35
8	33	36
9	33	35
10	34	37

a. The temperature in the refrigerator should be kept as close as possible to 35°F. Based on the table, is the mean temperature of the refrigerator closest to 35°F at 8:00 A.M. or at 4:00 P.M.? Show your work and explain your reasoning to support your answer.

Answer: _____

b. The formula $°C = \frac{5}{9}(°F - 32)$ converts degrees Fahrenheit (°F) to degrees Celsius (°C). How many degrees Celsius is 35°F?

Show your work to support your answer.

Answer: _____

HMSC1072c

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